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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/085,445	02/28/2002	Evren Eryurek	30203/38233/US	1836
4743	7590	12/28/2004	EXAMINER	
MARSHALL, GERSTEIN & BORUN LLP 6300 SEARS TOWER 233 S. WACKER DRIVE CHICAGO, IL 60606			PHAM, THOMAS K	
			ART UNIT	PAPER NUMBER
			2121	

DATE MAILED: 12/28/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/085,445	ERYUREK ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Thomas K Pham	2121	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on 16 September 2004.  
 2a) This action is FINAL.                    2b) This action is non-final.  
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1-35 is/are pending in the application.  
 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
 5) Claim(s) \_\_\_\_\_ is/are allowed.  
 6) Claim(s) 1-27 and 29-35 is/are rejected.  
 7) Claim(s) 28 is/are objected to.  
 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.  
 10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) All    b) Some \* c) None of:  
 1. Certified copies of the priority documents have been received.  
 2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | Paper No(s)/Mail Date. _____  |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>12/02/04</u> . | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
|   | 6) <input type="checkbox"/> Other: _____                                    |

***Response to Amendment***

1. This action is in response to request for re-consideration filed on 09/16/2004
2. Claims 1-27 and 29-35 have been considered but they are not persuasive.
3. Claim 28 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

***Information Disclosure Statement***

4. The information disclosure statement filed 12/02/2004 has been reviewed by the Examiner. However, a communication between applicants and the European Patent Office cannot be considered since this information will not appear in a face of a U.S. Patent.

**Quotations of U.S. Code Title 35**

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

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6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

### **Claim Rejections - 35 USC § 103**

7. Claims 1-7, 12-32 and 34-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,533,413 ("Kobayashi") in view of U.S. Patent No. 5,134,574 ("Beaverstock").

#### **Regarding claims 1 and 26**

Kobayashi teaches a method of using a degradation level of a process entity within a process plant, comprising: estimating a level of degradation of the process entity at a first time based on one or more process parameters associated with the process entity (col. 3 line 66 to col. 4 line 12, "an equipment state model ... life time state"). Kobayashi does not teach comparing the estimated level of the degradation of the process entity at the first time to a predetermined desired level of degradation of the process entity at the first time; and altering the operation of the process entity based on the comparison step to drive an estimated level of degradation of the process entity at a second time after the first time to be approximately equal to a predetermined desired level of degradation of the process entity at the second time, wherein the predetermined desired level of degradation of the process entity at the second time is greater than the predetermined desired level of degradation of the process entity at the first time. However, Beaverstock teaches comparing the calculated level of operation with a predetermined target

value (col. 8 lines 44-63, "to construct the calculation ... to provide ideal operation/performance) and adjusting the control process toward target performance based on the comparison result (col. 16 lines 4-28, "In an algorithm block 63 ... predefined target measures") for the purpose of adjusting the control process toward the target performance. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the comparison of Beaverstock with the system of Kobayashi because it would provide for the purpose of adjusting the control process toward the target performance to achieve ideal performance.

**Regarding claims 2, 18 and 29**

Kobayashi teaches estimating the level of degradation includes using a model of the process entity to estimate the level of degradation of the process entity (col. 7 lines 9-20, "a deterioration model for ... may be delayed").

**Regarding claims 3, 19 and 30**

Kobayashi and Beaverstock teach estimating the level of degradation of the process entity, comparing the estimated level of degradation of the process entity at the first time to the predetermined desired level of degradation of the process entity at the first time (see Beaverstock col. 8 lines 44-63, "to construct the calculation ... to provide ideal operation/performance), and altering the operation of the process entity based on the comparison (see Beaverstock col. 16 lines 4-28, "In an algorithm block 63 ... predefined target measures") are each repeated at various times during the operation of the process entity for different times (see Kobayashi col. 6 lines 22-33, "Through the calculation ... reaches a predetermined value").

**Regarding claims 4, 20 and 31**

Kobayashi and Beaverstock teach designating a fiducial line including a plurality of points, each point defining a predetermined desired level of degradation of the process entity at a different time and wherein comparing includes using the fiducial line to determine the predetermined desired level of degradation of the process entity at the first time and altering the operation of the process entity includes using the fiducial line to determine the predetermined desired level of degradation of the process entity at the second time (see Kobayashi col. 6 lines 53-66, “the relationship between … deterioration estimation”).

**Regarding claims 5 and 21**

Kobayashi teaches altering the fiducial line during operation of the process entity to thereby change the desired level of degradation at one of the first or second times (col. 8 lines 44-54, “A model or module … to the respective graphs”).

**Regarding claims 6, 22 and 32**

Kobayashi teaches the fiducial line defines a plurality of points between a clean and a fouled condition of the process entity (col. 6 lines 53-66, “the relationship between … deterioration estimation”).

**Regarding claims 7 and 23**

Kobayashi teaches altering the operation of the process entity includes using an optimization procedure to alter the operation of the process entity (col. 10 lines 56-62, “when deterioration model … with reference to FIG. 13”).

**Regarding claims 12, 24 and 27**

Kobayashi teaches using a result of the comparison to produce an index defining a utilization of the process entity (col. 7 lines 54-60, “A model correction ... extinguished or reduced”).

**Regarding claims 13 and 25**

Kobayashi teaches altering the operation of the process entity includes defining a line between the estimated level of degradation of the process entity at the first time and the predetermined desired level of degradation at the second time and using the defined line to alter the operation of the process entity (col. 8 lines 44-54, “A model or module .. respective graphs”).

**Regarding claim 14**

Kobayashi teaches using the defined line includes using the slope of the defined line (col. 9 lines 16-22, “Each module constituting ... stress S is increased”).

**Regarding claims 15 and 34**

Kobayashi teaches collecting data indicative of the process parameters from multiple data sources (col. 7 lines 40-47, “A stress information ... deterioration model portion 1”).

**Regarding claims 16 and 35**

Kobayashi teaches collecting data includes collecting process control data and collecting process maintenance data (col. 7 lines 48-53, “A memory means 3 ... from memory means 3”).

**Regarding claim 17**

Kobayashi teaches a process control system adapted to use a degradation level of a process entity within a process plant that has a processor communicatively connected to multiple process devices, comprising: a memory (col. 4 lines 21-23, “A memory means 3 ... of the equipment”); a first routine stored on the memory and adapted to be executed on the processor to estimate a

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level of degradation of the process entity at a first time based on one or more process parameters associated with the process entity (col. 3 line 66 to col. 4 line 12, “an equipment state model ... life time state”). Kobayashi does not teach a second routine stored on the memory and adapted to be executed on the processor to compare the estimated level of degradation of the process entity at the first time to a predetermined desired level of degradation of the process entity at the; and a third routine stored on the memory and adapted to be executed on the processor to determine an alteration for the operation of the process entity based on the comparison of the second routine to drive an estimated level of degradation of the process entity at a second time after the first time to be approximately equal to a predetermined desired level of degradation of the process entity at the second time, wherein the predetermined desired level of degradation of the process entity at the second time is greater than the predetermined desired level of degradation of the process entity at the first time.

8. Claims 8-11 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kobayashi in view of Beaverstock and further in view of U.S. Patent No. 5,877,954 (“Klimasauskas”).

**Regarding claims 8 and 33**

Kobayashi and Beaverstock teach estimating the level of degradation of the process entity within a process plant but does not teach a furnace within the process plant. However, Klimasauskas teaches a refinery or a chemical processing plant (col. 4 lines 40-43, “the representative plant is ... flow rate variables”) for the purpose of increasing the process control model’s accuracy and usability. Therefore, it is obvious to one of ordinary skill in the art at the time the invention was

made to incorporate processing plant of Klimasauskas with the degradation level estimation of Kobayashi and Beaverstock because it would provide for the purpose of increasing the process control model's accuracy and usability.

**Regarding claim 9**

Klimasauskas teaches altering the operation of the process entity includes changing a flow rate through the furnace (col. 4 lines 55-57, "The collected data ... by a flow meter 78").

**Regarding claim 10**

Klimasauskas teaches altering the operation of the process entity includes changing a temperature associated with the furnace (col. 4 lines 47-55, "the collected data ... measured by analyzers").

**Regarding claim 11**

Klimasauskas teaches altering the operation of the process entity includes changing an amount of steam injected into the furnace (col. 4 lines 55-59, "The collected data ... controlled by a valve 86").

***Response to Arguments***

In the remark, the applicants argue that cited reference fails to disclose:

- I) "comparing the estimated level of the degradation of the process entity at the first time to a predetermined desired level of degradation of the process entity at the first time" as to claims 1-35.
- II) "altering the operation of the process entity based on a comparison of the estimated level of degradation with a desired level of degradation" as to claims 1-25.

III) "using a result of comparison to produce an index defining a utilization of the process entity" as to claims 26-35.

In response to applicants' arguments,

I) It is noted that prior art Beaverstock (5,134,574) teaches column 8 lines 44-52:

*"to construct the calculation algorithms for the dynamic performance measures of interest. The calculation algorithms mathematically state the measurements established at 68 of FIG. 2 that determine if the manufacturing strategy is working and generally are common or determinable mathematics. Also the calculation algorithms include target, predetermined values and comparisons between currently calculated values and the target values."*

Applicants stated in the remark: the calculated values of Beaverstock is not the same or similar to an estimated level of degradation. However, from the original specification page 7 lines 8-10:

*"a process plant estimate a level of degradation of the process entity at a first time based on one or more process parameters associated with the process entity".*

Clear from the description above, the "estimated level of degradation" derived from parameters or measurements associated with the process entity. Beaverstock "calculated value for the dynamic performance measures" based on the measurements that determine if the manufacturing strategy (planning or estimating) is working or not. Therefore, there is no distinction between the "calculated value for the dynamic performance measures" of Beaverstock and the limitation "estimated level of degradation" as stated in the claims. Therefore, limitations are met by the reference.

II) Beaverstock also teaches column 16 lines 13-23:

*"Subsequent to the building and displaying of the comparison results in various display objects, an operator/user adjusts control means and hence adjusts process means accordingly. That is, real time display of the comparison of calculated current performance to predetermined target performance in terms of production/resource factors of administration, enables operator adjustment of process means, and hence resource/production factors, immediately during subject manufacturing toward target performance, i.e., toward desired values of resource/production factors."*

Clearly, adjusting the control and the process based on the comparison result as discussed above is the same as or similar to the “altering the operation of the process entity based on a comparison of the estimated level of degradation with a desired level of degradation” limitation of the claims. Therefore, limitations are met by the reference.

III) Prior art Kobayashi (5,533,413) teaches column 4 lines 56-60:

*“More specifically, a represents a coefficient representing the degree to which the body thickness is reduced by the slurry, and is determined on the basis of past maintenance records, such as checking by the operator, exchange periods priorly experienced, etc. b represents a coefficient representing the initial value of body thickness, and is determined on the basis of equipment management information, etc.”*

Again, applicants stated in the remark: the “parameters or coefficients” that are changed based on a comparison result are not the same as or similar to “an index” defining a utilization of a process entity based on a comparison result. It is noted that the term “index” *for defining a utilization of the process entity* to one of ordinary skill in the art is a “guide” or an “indication” *for defining a utilization of the process entity*. A “coefficient” of Kobayashi is an indication that *represents the degree to which the body thickness is reduced* (or utilization). Therefore, it is clear that the “parameters or coefficients” of Kobayashi is the same as or similar to the “index” as claimed. Thus, limitations are met by the reference.

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***Conclusion***

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to examiner *Thomas Pham*; whose telephone number is (571) 272-3689, Monday to Thursday from 6:30 AM - 5:00 PM EST or contact Supervisor *Mr. Anthony Knight* at (571) 272-3687.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

**Thomas Pham**  
*Patent Examiner*

*TP*

December 17, 2004

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